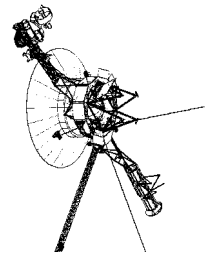


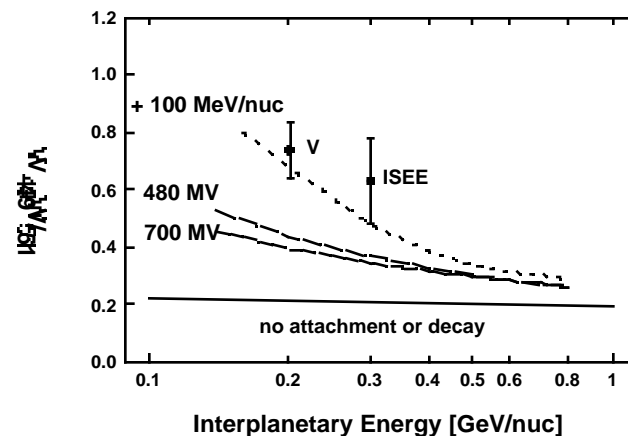
Voyager Observation of K-capture Decay of Cosmic Rays



The important aspect of the possible cosmic-ray reacceleration process in our galaxy can be studied from the isotopic composition of K-electron capture nuclei.

The K-capture decay is important at low energies and both Voyager spacecraft are at large heliocentric distances where adiabatic losses are small and measured energy of cosmic rays is close to interstellar energy.

The K-capture decay is observed in Voyager CRS experiment by studying the isotope composition of Ti, Cr, and V elements.



In effect the isotope ^{49}V is found to be underabundant by $\sim 25\%$ corresponding to the K-capture decay of ^{49}V to ^{49}Ti and the isotope ^{51}V is found to be overabundant corresponding to the decay of 25% of the K-capture isotope ^{51}Cr to ^{51}V .

The Voyager CRS experiment suggests that, because the percent decay of ^{51}Cr and ^{49}V is more than that expected from propagation calculations at the current interstellar energy, some reacceleration has indeed occurred.

The energy gain (reacceleration) between electron attachment and observation implied by Voyager data could be as much as ~ 130 MeV/nuc or about 25% of current interstellar energy of 500 MeV/nuc.

The results of this study are submitted for publication in A&A